

CLAIMS

What is claimed is:

5 1. A bone segment positioning apparatus comprising:
a guide wire having a proximal end and a distal end;
a distal stop disposed on said guide wire about adjacent to said guide wire distal
end;
a proximal stop disposed on said guide wire about adjacent to said guide wire
proximal end; and
a tube disposable over said guide wire and having a sidewall including a radially
expandable anchor portion adapted for radial expansion upon compression of said tube between
said distal stop and said proximal stop.

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15 2. The apparatus according to claim 1 further comprising a dilator having a tapered distal
surface, an at least partially transverse proximal surface and a tubular inner surface defining a
longitudinal through hole; said dilator being disposable on said guide wire wherein said guide
wire extends through said through hole;
wherein said at least partially transverse proximal surface serves as said distal stop.

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3. The apparatus according to claim 2 wherein said at least partially transverse proximal
surface is countersunk to accept said tube.

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4. The apparatus according to claim 2 wherein said tapered distal surface includes means to
prevent rotation of said dilator relative to said guide wire.

5. The apparatus according to claim 4 wherein said guide wire includes a distal tip having a
diameter greater than the diameter of said longitudinal through hole.

6. The apparatus according to claim 5 wherein said means to prevent rotation comprise a polygonal mating surface adapted to fit an opposite gendered polygonal mating surface of said distal tip.

5 7. The apparatus according to claim 1 wherein said proximal stop is formed as a distal surface of a compression fastener disposed over said proximal end of said guide wire.

8. The apparatus according to claim 7 wherein said compression fastener comprises at least one nut threaded onto said proximal end of said guide wire.

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9. The apparatus according to claim 7 wherein said compression fastener includes an interface washer adapted to engage a proximal bone segment.

10. The apparatus according to claim 1 wherein said tube and guide wire are flexible.

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11. The apparatus according to claim 1 wherein said radially expandable anchor portion comprises a plurality of ribs formed between a plurality of longitudinal slots disposed through said sidewall.

20 12. The apparatus according to claim 1 wherein said radially expandable anchor portion is disposed toward said distal end.

13. The apparatus according to claim 10 wherein said ribs include at least one reduced section formed in a central portion of each rib.

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14. The apparatus according to claim 13 wherein said at least one reduced section comprises a crease formed transversely across said central portion of each rib.

30 15. The apparatus according to claim 13 wherein said at least one reduced section comprises a narrowed section of each rib.

16. The apparatus according to claim 11 wherein said plurality of rib portions comprise at least two evenly spaced ribs.

17. The apparatus according to claim 1 wherein said radially expandable anchor portion is 5 adapted to collapse upon relaxation of compression forces between distal and proximal segments of said tube.

18. The apparatus according to claim 1 wherein said radially expandable anchor portion is adapted to collapse upon application of tension between distal and proximal segments of said 10 tube.

19. The apparatus according to claim 1 further comprising a bioactive material.

20. The apparatus according to claim 1 comprising a plurality of radially expandable anchor 15 portions.

21. The apparatus according to claim 11 wherein at least one of said ribs includes a textured surface.

20 22. The apparatus according to claim 1 further comprising at least one semi-annular cut in said tube.

23. A long bone segment positioning apparatus comprising:

a flexible guide wire having a proximal end and a distal end;

25 a distal stop disposed on said guide wire about adjacent to said guide wire distal end; a proximal stop disposed on said guide wire about adjacent to said guide wire proximal end;

a flexible tube disposable over said guide wire and having a sidewall including a radially expandable anchor portion adapted for radial expansion upon compression of said tube between 30 said distal stop and said proximal stop;

a dilator having a tapered distal surface, an at least partially transverse proximal surface and a tubular inner surface defining a longitudinal through hole; said dilator being disposable on said guide wire wherein said guide wire extends through said through hole;

5 wherein said at least partially transverse proximal surface is countersunk to accept said tube and serves as said distal stop;

wherein said guide wire includes a distal stop having a width greater than the diameter of said longitudinal through hole;

wherein said proximal stop is formed as a distal surface of an interface washer installed over said proximal end of said guide wire;

10 wherein said radially expandable anchor portion comprises a plurality of evenly spaced ribs formed between a plurality of longitudinal slots disposed through said sidewall;

wherein said radially expandable anchor portion is disposed toward said distal end for engagement with a distal bone segment;

15 wherein said ribs include at least one reduced section formed in a central portion of each rib segment; and

wherein said radially expandable anchor portion is adapted to collapse upon relaxation of compression forces between distal and proximal segments of said tube.

24. A method for aligning bone segments comprising:

20 installing a tube in an intramedullary space spanning a fracture;
anchoring a portion of said tube to a first side of said fracture;
compressing said tube to radially expand an expandable anchor portion of said tube on a second side of said fracture.

25 25. The method according to claim 24 further comprising:

installing a guide wire in said intramedullary space spanning said fracture;
wherein said tube is installed over said guide wire;
and wherein said tube is compressed between stops on said guide wire.

30 26. The method according to claim 25 further comprising installing a tapered dilator over said guide wire prior to installing said tube over said guide wire;

wherein said dilator includes a transverse portion which serves as one of said stops.

27. The method according to claim 25 wherein said step of anchoring a portion of said tube to a first side of said fracture comprises installing an anchor nut over a proximal end of said

5 guide wire.

28. A method for aligning fractured bone segments comprising:

installing a guide wire in an intramedullary space spanning said fracture;

installing a flexible tube over said guide wire in said intramedullary space spanning a fracture;

10 anchoring a portion of said flexible tube to a first side of said fracture;

compressing said flexible tube to between stops on said guide wire to radially expand an expandable anchor portion of said flexible tube on a second side of said fracture.

29. The method according to claim 25 further comprising installing a tapered dilator over

15 said guide wire prior to installing said tube over said guide wire;

wherein said dilator includes a transverse portion which serves as one of said stops.

30. The method according to claim 25 wherein said step of anchoring a portion of said tube to a first side of said fracture comprises installing an interface washer over a proximal end of

20 said guide wire.

31. The method according to claim 25 further comprising:

drilling into said intramedullary space in a proximal bone segment; and

reaming said intramedullary space.

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32. The method according to claim 25 further comprising:

releasing compression on said flexible tube to allow said expandable anchor portion to retract for removal of said tube and guide wire upon healing of said bone segments.